

Manchester Cotton and Woolen Manufacturing Co.
(Standard Paper Manufacturing Company)
Southern Bank of the James River at Mayo Bridge
Richmond
Richmond City
Virginia

HAER No. VA-44

HAER
VA,
44-RICH,
114-

REDUCED COPIES OF MEASURED DRAWINGS

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20240

HISTORIC AMERICAN ENGINEERING RECORD

MANCHESTER COTTON AND WOOLEN MANUFACTURING COMPANY
(STANDARD PAPER MANUFACTURING COMPANY)

HAER No. VA-44

HAER
VA,
44-RICH,
114-

Location: Abutting the western side of Mayo's Bridge along the southern bank of the James River, south of Richmond, Virginia, at 7 Hull Street, in South Richmond.

Universal Mercator Coordinates: 18.284760.4155900
Richmond Virginia Quadrangle

Date of Construction: Ca. 1837. Western additions, ca. 1845, 1910-1919. Northern additions, 1920s.

Present Owner: Kenneth J. Aspinwald
P.O. Box 24410
Richmond, Virginia 23219

Present Use: Vacant and condemned. May be demolished for flood wall construction.

Significance: The Manchester Cotton and Woolen Manufacturing Company was among the first textile mills to operate in the Richmond area and represented one of the early efforts to diversify the predominately agrarian economy of antebellum Virginia. The Manchester company was the first to use the water power developed by the Manchester Canal, which later supplied power for grain, paper, sumac, and wood-working facilities. The original building, operated as a cotton mill at this site from ca. 1837 until the early 1890s. The Standard Paper Company purchased the property in 1901. The original portion of the mill remained in use as a warehouse from 1901 until 1976. Today, the well-preserved exterior of the original mill, the canal, and the remnants of the water delivery system and the wheel housings are tangible evidence of pioneering efforts by southern industrialists to enter a market dominated by northern companies.

Historian: Joseph A. Rodriguez
August, 1986

Background

Richmond's highly acclaimed tobacco, flour, and iron industries obscured the role cotton manufacturing played in the area during the nineteenth century. The country's largest flour mills shipped the staple to markets around the world while numerous tobacco factories processed the brown leaf for European and domestic buyers, each overshadowing the production of the cotton mills. As a result, secondary source material is not well-developed and primary sources are fragmentary. The location of the city's two cotton mills along the southern bank of the James River in the suburb of Manchester further contributes to the absence of good historical documentation. Perhaps coverage of this industry would be more extensive if it had enjoyed greater prosperity. Nevertheless, the history of one company--the Manchester Cotton and Woolen Manufacturing Company--does contribute to a better understanding of an early attempt to diversify the region's predominantly agrarian economy.

Cotton manufacturing in the antebellum South developed slowly and unevenly. While visionary manufacturers established large mill towns throughout Massachusetts, Connecticut, and Rhode Island, southern planters invested their money in the cultivation of cotton and tobacco fields. They bought land and slaves rather than factories and machines. As long as cotton prices remained high and land relatively cheap, Southern planters had few incentives to invest in manufacturing.

Those individuals who considered opening a factory soon realized that there was little Southern demand for ready-made clothing because the region's craft tradition satisfied most of the South's textile needs. Southern families, white and black, spun and dyed cloth and sewed many of their own garments; few bought factory-made vestments at local stores. They had little reason to do so since the cotton was readily available and inexpensive, and because the nearest stores were often miles away from the scattered farms.

A few Southerners, however, did attempt to establish cotton factories in the region. Some took advantage of the British sea trade embargo during the War of 1812 which cut off the South's cotton from northern manufacturers. These men established small yarn factories throughout North and South Carolina, Georgia, and Tennessee. But after the war, northern companies resumed production, putting the infant industries out of business.¹

Another hesitant step towards large-scale Southern textile production occurred during the 1830s when southern leaders reacted angrily to the national tariff. The tariff raised the price of British manufactured goods, including textiles. This was detrimental to Southern cotton farmers who sold their raw product to English manufacturers. During this period, local merchants and commercial agents established mills throughout the region. Most of these mills remained profitable into the 1840s when a slump in cotton prices lowered factory labor costs and encouraged planters to make investments in manufactures.²

Geographical and financial problems, however, kept Southern textile investors from realizing substantial profits during the antebellum years. The lack of urban growth stunted the demand for ready-made clothing and allowed local household production to satisfy the region's textile needs. Poor roads and limited railway lines failed to reach the sources of waterpower. The region's small streams which turned the cotton mill's water wheels and turbines generated insufficient horsepower during the fall months and often dried up during the summer months.³

Many antebellum manufacturers confronted these problems. In Virginia, however, there were many rivers, easy access to ocean ports, urban markets, and sufficient cheap labor, so prospective manufacturers found starting cotton factories less risky. By the late-1830s, Virginia had twenty-three cotton mills, many located around Petersburg, a town situated about 30 miles south of Richmond. In 1837, the Manchester Cotton and Woolen Manufacturing Company opened a mill in Manchester, on the southern bank of the James River.⁴

In spite of the early optimism that characterized these initial efforts towards textile manufacturing in Virginia, economic conditions for textiles worsened during the 1850s. The resurgence of cotton prices forced factory owners to outbid planters for workers. High labor costs were compounded by the lack of sufficient investment capital and high interest rates. The region's wealth was invested in land and slaves, leaving Southern bankers short on funds to lend factory owners.⁵

These pressures diminished profits and forced some mills to close. In 1855 the Manchester Cotton and Woolen Manufacturing Company stockholders considered selling their mill because of its low earnings. The company board members formed a committee to study the establishment's prospects and ascertain its future profitability. This group finally concluded, however, that recently purchased new machinery and improvements made in the carding and spinning departments would make the mill solvent in the near future, and they recommended that the board members retain ownership of the cotton mill.⁶

Those mills that survived the 1850s faced a serious challenge during the Civil War. The hostilities slowed the flow of raw cotton from the plantations into the mills and disrupted sales to foreign and domestic markets, while in some cases, military occupation stopped production altogether.⁷

These factors and others impeded the growth of Southern textiles mills before and during the Civil War. After the war, the economic climate for cotton manufacturers did not improve significantly. Nationwide economic depressions severely affected the South's marginally profitable cotton mills. The 1870s were especially difficult years, as many mills owners throughout Petersburg and Richmond were forced to temporarily suspend production while others found it necessary to sell their factories. The Manchester cotton mill changed owners two times during this decade, once in 1871 and again in 1876, when slumping profits induced the cotton mill's owners to sell the building and its machinery to S. P. Arrington of Petersburg.⁸

The economic problems of the 1870s spurred Southern leaders to call for greater investment in manufacturing during the 1880s. Prominent journalists, writers, and businessmen campaigned for a "New South" based on a well-balanced economy of farms and factories, fields and cities. Many of their ideas sprang from a belief that Washington politicians, particularly Republicans, had not dealt fairly with the South and that a stronger economic base would help solve problems of poverty while creating jobs, roads, schools, hospitals, and more productive farms.

The New South advocates called for a concentrated program to invest capital in land and manufacturing. They urged Southern politicians to lower corporate taxes, build railways and highways, and invest in public works. They insisted that the South had the resources to compete successfully against northern capitalists. They pointed out that coal deposits had gone untapped during the slave years and called for a concerted effort to exploit the South's mineral deposits.⁹

While cotton mills were never very successful during the antebellum period and even into the 1870s, textile manufacturing flourished during the 1880s. Most of this spurt in production came from Southern based capital, not as a result of the migration of Northern funds. Cities like Augusta, Georgia and Charlotte, North Carolina became the centers of large textile companies as well as the home of engineering firms, machinery manufacturers, and financial institutions.¹⁰

However, the success of these Southern cotton mills in the 1880s was not totally without an industrial precedent. Several other Southern industries flourished during the antebellum years, especially in Richmond. The city on the James enjoyed numerous industrial advantages. Tobacco, cotton, and coal supplies were abundant, while the river allowed easy access to ocean ports where ships brought goods to markets located throughout the country and around the world. Richmond's industries attracted migrants seeking jobs in the various factories, and this growing population, in turn, constituted large markets for manufactured goods. By the Civil War, Richmond had become the South's greatest industrial metropolis.

Raw tobacco remained Richmond's most valuable export commodity through the first two decades of the nineteenth century, as local farmers constantly expanded their holdings into nutrient-rich fields to increase output. By 1818, increased European demand raised prices and Richmond's export trade boomed. At that time, however, some Richmond tobacco merchants switched from exporting the raw leaf and began processing the valuable crop in their newly established factories. Richmonders labored in eleven tobacco factories in 1819, forty-three by 1859, and fifty by 1860, the most of any city in the country.¹¹

Though tobacco was the city's leading commodity, wheat was Richmond's oldest, having first been milled in the 1790s. By the 1830s wheat was the city's second leading export product. The city's flour mills were producing large

quantities of the staple and shipping it to buyers in Latin America and Brazil, where coffee was imported in exchange. By the 1850s the flour trade supported seven large mills, one of which, the Dunlop and McCance mill, operated in Manchester.¹²

Though the region around Richmond was rich in coal, the source of coke needed for iron smelting, it took the laying of Virginia's railway in the 1830s and 1840s to stimulate the growth of the metropolis' iron industry. By the mid-nineteenth century, city foundries molded wrought-iron, cast-iron and manufactured related products such as steam engines and cannons. The Tredagar Iron Works, established in the late 1830s, soon became the city's largest employer and played a leading role in arming the Confederacy during the Civil War. In 1860 iron manufactures employed twenty percent of Richmond's labor force and grossed more than two million dollars.¹³

By the mid-nineteenth century these Richmond industries had attracted new residents and the city's population grew steadily. From 1850 to 1860 the population increased from 27,500 to nearly 38,000. Ten years later the city had grown to over 50,000.¹⁴

The small town of Manchester, situated along the southern bank of the James River, benefited from Richmond's growth and its emergence as a major Southern industrial center. By 1873 Manchester had just over 5,000 residents. By 1879 the town's population had risen to about 6,500 and by the early twentieth century it had reached 15,000.¹⁵

The town's population growth, particularly in the 1870s, fundamentally transformed its social character. While in the early 1800s Richmond businessmen had established summer residences in Manchester, by the late-nineteenth century it had taken on a working-class identification. As black and white laborers became a permanent and significant part of the small town, Richmonders increasingly looked down on the community. During a struggle over annexation in 1879, Richmond's political leaders complained about the impact an increased number of blue collar voters would have on city elections. Eventually Manchester came to be referred to as "Dogtown."¹⁶

Despite the aspersions cast by Richmond residents, blacks and other white laborers probably found Manchester a viable alternative to the larger city's segregated and expensive neighborhoods. Antebellum black servants lived near their white employers, but by the eve of the Civil War, blacks increasingly formed their own areas in the city. After 1870, whites closed off their neighborhoods and forced blacks to the city's peripheries. Manchester provided the outcast group with old and inexpensive housing located near employment opportunities in Chesterfield County's tobacco fields and close to menial jobs in Richmond's industrial sector at the north end of the Mayo Bridge. Typically, blacks worked as housekeepers, farm laborers, and industrial laborers in the tobacco factories and grain mills. Irish and Scottish names appear throughout the census rolls, listed as laborers, housekeepers, seamstresses, and in the cotton and grain mills.¹⁷

Manchester's growth at the end of the nineteenth century came only after decades of efforts by town leaders to attract residents and employers. Colonel William Byrd II originally laid out the town in 1769 and soon several British commercial agents and tobacco inspectors took advantage of the settlement's inexpensive land prices and established trading outposts in the area. Captain John Mayo, who in 1788 built a toll bridge between the suburb and the metropolis, constructed a flour mill and a power canal alongside the James sometime before 1769. The town of Manchester purchased the flour mill and the canal in the early nineteenth century.¹⁸

The Manchester Canal required constant maintenance and repairs. Throughout the nineteenth century, frequent storms brought high water that damaged the canal's walls and gates. The town improved the canal's stone dam, head gates, and waste gates. During periods of low water, town officials authorized the extension of the stone dam and the dredging of the head race channel to increase the flow of water to the mills.¹⁹ In the 1860s, 1870s, and 1880s floods on the James River ravaged the dam and canal. In October of 1870, a flood forced several mills to close temporarily. Afterward, the trustees determined that the headgates, the water gates, and the wasteway needed repairs. In August of the next year a drought decreased the water level in the canal and temporarily halted production.²⁰

The canal that Manchester officials labored so hard to maintain in good repair was the town's major civic investment. It began on the west with a 3' high, 900' long stone dam that reached into the James River. Manchester residents paid \$2,570 for the dam, most of which was built in 1858 with the final 50' constructed in 1878. On the east the canal emptied into a pond that probably helped to regulate the amount of water available to the various mills in the area. In 1867, the canal carried over 7,000 cubic inches of water under a three-foot head. Current maps indicate that the canal is 38' wide near the Manchester cotton mill and about 4,500' long from its western opening to the point where it empties into the James River.²¹

The canal appears typical of the water power channels in the region. Because the James lacked a substantial water fall at any one point, mill owners and town trustees were forced to build rather long canals. In the case of the Manchester cotton mill, the water entered the canal and traveled about 2,000 feet before it reached the mill. It then stood about seventeen feet above the river. This drop produced a powerful head which turned the turbines that powered the textile machinery.

The need for a sufficient fall between the canal and the river played a significant role in determining the location of mills along the Manchester canal. Because the height of the fall increased with the distance from the western opening of the canal, all of the large mills occupied sites on the eastern end of the canal near Mayo Bridge. Smaller mills, that did not need a significant amount of water power could locate closer to the western end.

The canal system boasted certain advantages and disadvantages for the mill

owners and city trustees. The owners benefited because the city paid all canal maintenance costs, while the mills simply paid water rents. The city trustees benefitted because the canal was a valuable selling points which they used to lure manufacturers into the area.

But the canal also had a major drawback. Water used by one mill could not be reused by others further downstream. In contrast, the mills around Petersburg occupied lots alongside the Appomattox River and each had its own stone dam that brought water into each mill's canal. After the water fell through one mill and powered the turbine, it reentered the river to be reused by another manufacturer downstream. Evidently, this recycling of water could not occur along the Manchester canal as several mills tapped into the water channel and only one stone dam reached into the river. This factor may have contributed to the episodes of inadequate water supply which frequently forced the cessation of production.²²

However, the design of the Manchester canal was not totally to blame for the lack of sufficient water power. Water supply problems in Manchester and Petersburg also stemmed from the fact that the mill sites sat on small to medium-sized rivers that could not produce much horsepower. While the New England milling cities of Lowell, Manchester, and Lawrence utilized rivers that provided from 12,000 to 15,000 horsepower at each site, the Appomattox River produced little more than 3,000.²³

Despite these drawbacks, the town of Manchester made the canal the focal point of its campaign to encourage industrial development on the south side of the James River during the mid- and late-19th century. Newspaper ads proclaimed the canal's supply of water sufficient for any miller's needs. Manufacturers need not worry about their power source, one ad suggested, because the "dam and canals are kept in order by (the town of Manchester)." Another ad noted that "no taxes are levied on improvements built or machinery operated" on the Manchester commons, located beside the canal.²⁴

The industries located on the canal generated an important source of city revenue. Companies rented water rights on an annual basis, and their payments represented a significant part of the town's funding. Rates stood at \$2.50 per square inch of water from the canal's inception until the 1880's when rents increased to \$4.00. The owners of the Manchester cotton mills, for example, paid \$2,000 per year in water rent. The fees paid by all the companies represented Manchester's second largest source of income and in 1879 produced more than \$8,500, or about 25% of the town's revenue and 73% of its total assets.²⁵

Site Development

Manchester leaders realized quite early in the nineteenth century that the canal could be quite lucrative. But this revenue would only come when industries established factories along the southern bank of the James. To

encourage industrial development, the town's trustees granted to Turner Sharp a mill site with water rights free of any payment of water rents for fifty years. Sharp did not build on the lot and in 1834 he sold the land and water rights to the Manchester Cotton and Woolen Manufacturing Company for \$6,000. The exact origins of this firm are not clear, but they encouraged its formation when town trustees in 1832 petitioned the Virginia legislation asking that "two general acts. . . be passed incorporating two joint stock companies." They funded this company through private subscriptions with a capital stock of \$100,000.²⁶

The Manchester Cotton and Woolen Manufacturing Company was incorporated in 1834 and between 1837 and 1840 erected the first substantial mill along the canal. Town trustees had hoped that this new company would spur further investment in the area. However, this did not occur. Partial explanations for its failure was because workers had completed the Kanawha Canal on the northern bank of the James River, thus motivating several manufacturers to leave Manchester and relocate near the newly completed ship channel. As late as 1859, only the Manchester Cotton and Woolen mill and the James River Manufacturing Company, cotton mill founded in 1848-49, appeared on maps of Richmond.²⁷ (See HAER Drawings, VA-44, Sheet 2)

By the 1860s, however, Manchester finally began to feel the effects of Richmond's growth. An 1864 city map indicated that several manufacturers had constructed plants in the area, including the Dunlop and McCance flour millers (located east of the Manchester cotton mill), a company that flourished during the later nineteenth century; and the city flour mills, abutting the eastern side of the Mayo Bridge.²⁸

By the late-1870s, nine manufacturers had located along the canal. Two companies founded in the last ten years included the Martin Brothers and the Baker sumac mill (1874), located at the far western end of the canal. West of the Manchester Cotton Mills stood the Manchester Paper Mills (founded in 1864). Five factories stood east of the Mayo Bridge: the city flour mills, Marshall Cotton Mills (which bought the James River Cotton mills in 1869), G. P. Stacy's mattress factory (founded in 1862), and an iron foundry.

By 1886 seven companies were using water from the Manchester canal. These included the Richmond Cedar Works (a bucket-making company founded in 1878); the Manchester Paper Mill; two flour mills (Walker and Saunders, Dunlop and McCance); two cotton mills--Manchester Cotton Mills (since 1871 referred to as Old Dominion Cotton Mills), and the Marshall Manufacturing Company; and, the Manchester Corn Mill.²⁹

Those companies grouped around the east end of the canal, conspicuously symbolized the central importance water power played for nineteenth century industrialization. Until the end of the nineteenth century the canal provided the focus for manufacturing. The late-1870s and early-1880s were the canal's peak years with nine factories utilizing its power. By the 1890s steam and electric power allowed factory owners to move away from the channel. By 1895

the city flour mill and Manchester corn mill no longer stood along the canal. The Richmond Spike and Iron Company occupied the old corn mill site. The rest of the area appeared largely unchanged through 1905 except that G. P. Stacy's mattress factory no longer existed. Standard Paper Company, which owned the lot, had erected a structure and between 1910 and 1919 they expanded that building to the east. It was also in 1919 that Dunlop mills expanded their factory eastward.³⁰ (See HAER Drawings, VA-44, Sheet 3)

By 1952, the Sanborn map showed the site altered in numerous ways. The Dunlop mills location was now occupied by Southern States Co-operative Grain Marketing Mills Inc. and Dixie-Portland Flour Mills. The lot on Hull and First Street (formerly the site of Standard Paper Company mill) was vacant. Standard Paper continued to occupy the old Marshall mill building and attached new structures. Of the original nineteenth century structures, only the Manchester cotton mill building definitely remains.³¹

The canal no longer plays a role in the manufacturing activities that take place in South Richmond (formerly Manchester). Today, the railroad lines and highways provide a central focus for several paper companies, a grain cooperative, petroleum refineries, a tobacco factory, and produce distributors. However, though unused, the canal remains a visible reminder of water power's central importance to nineteenth century industry.

Structural Features (Exterior)

Mathew Brady documented the Civil War's calamitous effect on Richmond in a series of panoramic photographs taken immediately after the hostilities ended in 1865. Several of his photographs included the James River's southern bank and the Manchester commons, where cotton and flour mills operated. These pictures suggest that the original portion of the mill remains largely intact and in its original condition. (See HAER Photo No. VA-44-33) These views show that the cotton mill's building retains its original fenestration and overall appearance. One reason for the building's architectural integrity was the cotton mill's modest financial success, which did not allow the company owners to alter the main structures or to expand into other areas along the Manchester canal.

The Manchester Cotton and Woolen Manufacturing Company building included two major sections, Mill #1 and Mill #2.* Mill #1 is a rectangular, four story brick building, eleven bays long and three bays wide, with load-bearing brick walls of common American bond and a rock-faced, coursed ashlar foundation. It measures about 50' wide and 100' long. Three-step parapet walls extended over either gable, with two slightly elevated square points (possibly chimneys), protruding from the middle step, centered over the roof. On either side of a centered, semi-circular arched window with a semi-circular brick arch above, are two quarter-round windows, each with a quarter-round brick arch above. (See HAER Photo Nos. VA-44-2 through VA-44-5) Like many nineteenth century cotton mills, its pitched gable roof originally included a clerestory and a

cupola over a stairtower on the south elevation.

Mill #2, built after Mill #1 (probably in the early 1840s), consisted of two rectangular brick sections; one three bay by six bay structure perpendicular to the river and joined at its southeast corner to a second section that paralleled the river. Both had three-step parapet roofs, and rock-faced coursed ashlar foundations. In the Brady photograph, the L-shaped Mill #2 appeared to be a three-story version of Mill #1 without a clerestory roof monitor window. A frame bridge with at least three windows connected the two mill buildings.

Beside the two main mill buildings, several smaller structures erected on the site during the nineteenth century included a building for the "picker room," first mentioned in 1871. (See HAER Photo No. VA-44-6 and VA-44-7) This structure still stands today although in poor condition. By the 1880s, additional buildings on the site included a brick boiler room and a small frame office. (See HAER Drawing VA-44, Sheet 2)

The cotton mill owners replaced Mill #2 with a new building sometime between 1886 and 1895. This three-story structure, destroyed by fire in 1984, was five bays wide on its east elevation, eight bays wide on its west elevation, and sixteen bays across its northern facade on the second and third floors; the first floor had only six bays. (See HAER Photo No VA-44-6) By the mid-1890s all but the two eastern first floor windows were infilled with brick. All windows were twelve over twelve sash with a three course brick arch and a concrete sill.

This new structure conformed to the boundaries of the older Mill #2 and enlarged these boundaries on the north elevation. The new structure stands on top of the old mill's foundation. Currently, the foundation windows are visible exactly as they appeared in the Matthew Brady photograph (See HAER Drawing VA-44, Sheet 4). Also, a photograph taken during the 1890s clearly showed the two different sections of Mill #2's foundation.

The prominent cupola atop a stair tower and a clerestory monitor window distinguished cotton mill structures in America during the early and mid-nineteenth century. The ringing bell awakened laborers each morning, sent them off for lunch during the day, and dismissed them from work at night. According to architectural historian, William H. Pierson, the cupola symbolized the capitalist mill owner's authority over his laborers and reminded them that factory production required workers to supplant themselves to the fast paced regimen set by machines. But the cupola was more than a symbol, it also had a functional role. By locating the stairway on the exterior wall of the mill, builders saved interior space for machinery and

*For clarity, the original mill abutting Mayo Bridge has been designated Mill #1 and the L-shaped mill to the west has been designated Mill #2.

protected against the spread of fire by closing off the flow of oxygen between floors.³²

The Manchester cotton mill's eight-sided cupola stood about 18' above the south elevation's stairtower. (See HAER Drawing, Sheet 7, and HAER Photo No. VA-44-33) This cupola had a dome top and open sides. It rested on a square stair tower that was centered on the south elevation. The stair tower had windows on its side and front elevations.

Though the clerestory window had no symbolic value, it was also a central feature of early cotton mill architecture. Clerestory windows turned attic floors into viable work spaces. The added light enabled workers to see as they manipulated fine threads and fabrics, while increased ventilation dissipated some of the intense heat and the floating cotton fibers and dust generated by the factory's machines. The clerestory window was the "trap door" type, meaning that it flared out from the roof ridge, as though the top half of the roof were raised slightly, leaving a space for a row of monitor windows. The clerestory did not run the total length of the roof, but stopped a few feet short of the parapet walls at each end. (See HAER Drawing VA-44, Sheet 4)

Mill #1's cupola and clerestory were probably original to the building's date of construction. They both survived until the mid-1890s. The stair tower stood at least until the 1930s.

A photograph taken in the mid-1890s shows a stair tower without a cupola and a roof without a clerestory. (See figure 4 at the end of this report) Another photograph (Figure 3), also taken during the mid-1890s, shows the three-step parapet roof with slight alterations. This suggested that the roof underwent alterations on two separate occasions, once during the late-1880s to the mid-1890s when the cupola and clerestory were eliminated and again during the early to mid-1890s. A fire possibly precipitated these changes on one or both of the occasions. One source noted that a fire struck the mill in 1886 but no confirmation has been found.³³

In 1901, the Standard Paper Company purchased the site, converted it into a paper factory, and initiated several minor structural changes. A Sanborn map dated 1905 suggested that they expanded the third story frame bridge to the second story and added a steam boiler to the old picker room structure.³⁴ Between 1910 and 1919, the paper company made several more substantive changes in both Mills #1 and #2. Between 1910 and 1919 they added two large rooms in the space where the frame bridge previously existed. The existence of a corbelled brick cornice on the north side of the dividing wall suggests that the new owners added the south room first and constructed the northern room later. In the northern addition are joist scars on what was Mill #1's second and third floor exterior west wall, probably indicating the point where the bridge attached to the building. Between 1919 and 1952 a two-story addition to Mill #1's north side was built. This rectangular addition extends to the southern bank of the James River.³⁵ (See HAER Photo No. VA-44-1)

Structural Features of Mill #1 (Interior)

An interesting interior feature in Mill #1 is the presence of cast-iron columns on the first through fourth floor. (See HAER Photo No. VA-44-26) If these columns are original they would represent an early use of cast-iron in American industrial buildings. Given the existence of major foundries in antebellum Richmond, cast iron was a locally available building material. In the building itself, there is no visible evidence of ghost marks in the floor or walls that would suggest replacement of earlier columns with cast-iron.

If a remodelling did occur, it may have been just after the Civil War when the company invested around \$50,000 in the mill. This investment, however, appears to have been for the purchase of machinery. Furthermore, by that time the use of cast-iron for structural purposes had become less popular. Prior to the Civil War, cast-iron was thought of as a fire-safe material. However, it was found to be more susceptible to shearing stress than wood and, if poorly cast, or cooled too rapidly following a fire, tended to collapse. Under the influence of powerful factory mutual fire insurance companies, mill owners began to select wood and later steel for columns, and these materials would probably have been selected for use in Mill #1 had there been a major remodelling in the last quarter of the 19th century.³⁶

On the other hand, there are several unanswered questions concerning the construction of Mill #1 that challenge the conclusion that the cast iron columns are original. First, why do the beams in the building line up over the window lintels instead of between the windows, as is usual practice? Does the presence of charred timbers under some lintels suggest that a major fire did occur? Does the plaster finish on the walls conceal evidence of joist pockets from earlier construction? These questions can only be adequately addressed through an intensive archaeological investigation of the structural components of Mill #1. Since this kind of investigation was not a part of the HAER recording project, the significance of the mills cast-iron column construction may not be fully known.

The cylindrical, cast-iron columns (4" in diameter) discussed above support the timber beams on each floor except in the basement where concrete columns are 1'-4" square. On the first, second, and third floor the columns are flanked on two sides by timbers 7" by 3-3/4". (See HAER Photo No. VA-44-23) Cross-bolted at 1/3 points, these timbers are most likely later additions to strengthen the framing system. Several of these flanked columns were enclosed on the remaining open sides by non-structural planks, thus enclosing the entire column in a box measuring about 9" x 11". (See HAER Photo No. VA-44-22) The fourth floor columns include no supplemental support, probably because they carry lighter loads. All columns are about 4" in diameter and are crowned by beam bearing plates. These plates have rounded ends with one bolt hole on either side. The columns travel 2 to 3 feet through the floor below, between the parallel beam timbers and rest on the top side of the beam bearing plate. (See HAER Photo No. VA-44-24) The second and third floors are

supported by beams consisting of two timbers bolted together, spanning each column bay. The beams rest on the beam bearing plates. The whole beam structure is 13-1/2" x 15-1/2". Each beam timber is 6" x 13-1/2". Fourth floor beams are about 7-3/4" x 9-1/2". (See HAER Drawing VA-44, Sheets 6 & 7)

The lower chord of the roof trusses support the fourth floor's ceiling and the attic floor. (See HAER Photo No. VA-44-26) Three spliced 2" x 12" timbers bolted together make up the built-up truss chords which are 5-3/4" x 12". (See HAER Photo No. VA-44-28) The southern-most truss chord is made of four 1" x 11-3/4" timbers which together are 4-1/2" x 11-3/4". Tie-rod bolts can be seen on the underside of the lower chord. The six-panel Howe truss has frame web members and vertical tie rods connecting the upper and lower chords which rest directly on the eaves. Bricks at the eaves have been removed to provide light and ventilation. (See HAER Drawing VA-44, Sheets 6 & 7) The workmanship in these trusses suggest they are of early twentieth century construction. All tension members (except the bottom chord) are of ferrous metal, and compression members are of rough sawn wood. There is none of the "finish" or adornment common to early or mid-nineteenth century construction, such as chamfered edges on wood members, or decorative iron castings.

In the western addition (constructed between 1910 and 1919) the round metal columns on the second floor are about 7" in diameter, while on the third floor they are about 6" in diameter. They support square wooden beams which rest on square beam bearing plates. In the southern addition on the third floor the roof beams rest on metal supports of varying heights to allow for the slope of the roof. (See HAER Photo No. VA-44-25)

All windows have solid single timber lintels and concrete sills. The semi-circular arched attic window on the south elevation is about one foot lower than the north window. The south opening may have been added after the stair tower's removal (after 1929) because the structure would have obstructed any light or ventilation from a window in this location. (See HAER Photo No. VA-44-5) However, stylistically the window appears to predate the removal of the stair tower.

The floors throughout the mill building are tongue-and-groove planks about 3" to 4" wide. The attic floor, which is very weak, appears newer than the other floors. There are concrete floors in the western additions.

What is most curious about Mill #1's structural evolution is that it became less fire safe by the early twentieth century. For example, sometime after 1929 the paper mill owners removed the stairtower and moved the stairway inside the building, which not only was riskier, but also decreased usable space. Partial explanation for such deviations from standard industrial safety design can be explained by the fact that after 1901 the building was used primarily as a warehouse and did not house machinery.

From Cotton Mill to Paper Mill

Two significant factors shape the development of this site during its fifty-plus years as a cotton mill. First, all improvements and changes in the operation of the plant had to occur within a geographically restricted area bounded by the Mayo Bridge on the east, the James River on the North, the power canal on the south, and the Manchester Paper Company (after 1865) on the west. Second, the business of textile manufacturing never produced profits which would have allowed extensive reinvestment or expansion of the plant or equipment. Wool manufacturing was abandoned after only a few years, certainly before 1850. While some minor alterations and additions were made in the nineteenth century, and some old equipment replaced by new machinery, the productive capacity of the cotton mill remained largely the same.

Statistics indicate the stagnant nature of the Manchester cotton mill in terms of capital investment and output. The number of spindles and looms, for example, stayed roughly the same beginning at 7900 spindles and 256 looms in 1850, and only reaching 9000 spindles and 250 looms by 1889. The same stagnation was seen in the mill's production. From 1850 to 1870 there was a decrease in the amount of cloth produced and in the total value of the cloth produced.

Certainly, the cotton mill owners did attempt to improve their plant's productivity over the years. In 1855 they invested \$21,487 to increase production and turn out "better work and more of it with fewer operatives."³⁷ By 1867, the mill owners had once again upgraded the factory's technology, this time by importing from England new machines costing \$50,000.³⁸ However, although these changes were made, the mill did not significantly expand either the number of spindles in operation or the level of output. In 1871 the factory's trustees sold the mill.³⁹

Another indication of the company's lack of prosperity was the fact that the owners altered the basic mill structure very little during the nineteenth century. The various processes that took place on each floor remained relatively constant. The mill was not expanded or altered significantly, probably because the company had little money to reinvest in alterations.

Mill #1 had 4-1/2 stories and a basement.⁴⁰ Throughout the nineteenth century, the first floor housed the packing and storage departments; the second, fourth, and fifth floors the weaving departments; and the second floor and the attic, the spinning departments (with 5000 spindles).

Mill #2 housed departments that both spun and wove textiles. In 1886, Mill #2's main block (connected to Mill #1 by a frame bridge) consisted of 3-1/2 stories. The first floor housed the machine and carpentry shop; the "warping" and "slashing" departments occupied the second floor, and the carding room was on the third floor. A second section of Mill #2 (paralleling the James River) was also a three story structure. The first floor housed the "lumber room,"

the second floor contained the spinning room (with 4000 spindles) and the third floor housed the carding department. South of this structure and connected to it by a "shaft" was the rectangular picker room building with a stable attached to its north elevation and a cotton shed attached to its west elevation.

Between 1886 and 1895 Mill #2 was demolished and rebuilt. The reason for these alterations has not been determined. However, the confined nature of the mill site made expansion difficult and may have precipitated the change. With little room to expand on the site, the mill owners were forced to rebuild upon existing foundations. The insurance maps showed that the building's functions, though rearranged on each floor, remained largely unchanged. It is also important to note that the maps continued to refer to the structure as though it had two parts. In other words, though the former L-shaped structure had been converted into a square structure, the maps continued to make two separate references to the function of the building. On the east side, the first floor remained the machine and carpentry shop, the second floor (warping and slashing departments in 1886) housed the carding section. The third floor (which was the carding section in 1886) now housed the warping and slashing departments. The west side by 1895 had a vacant first floor (the lumber room in 1886), a carding room on the second floor (the old spinning room), and a slashing room on the third floor.

The significance of the map references seem clear. First, they suggested that the old Mill #2 layout and structure continued to influence the square building after its construction. The old mill's foundations supported the new building. Also, since no new activities were added after these alterations, the owners probably initiated the changes to expand old operations. Had there been room on the site they could have simply built a new structure and changed the function of Mill #2. But because of the restrictive lot size they razed Mill #2 and rebuilt an expanded version. That they failed in this attempt to enhance the mill's economic viability is indicated by the fact mill operations were suspended in the 1890s.

Just as the Manchester cotton mill owners failed to significantly expand or alter the mill site or its machinery, they also evidently did not have sufficient funds to increase the mill's overall operating power. There appears to have been little change or addition to the water power system during the nineteenth century. Beginning in the early 1840s, the company had installed two wheels, one serving each mill. This basic arrangement remained intact into the 1880s. In 1884 the "two large turbine wheels," one fifty-two inches and the other forty-eight inches in diameter powered the cotton mill.⁴¹

The two-wheel system remained intact until 1895 when the Sanborn map indicated the existence of a third wheel. However, there is no way of knowing if all three wheels were in operation. The map showed that wheel #1 powered Mill #1 and stood near the northwest corner of that mill. Wheel #2 powered Mill #2 and was located to the west of wheel #1, along the eastern wall of Mill #2. Wheel #3, which also powered Mill #2, was located just south of where the two

buildings of Mill #2 joined. Only wheels #1 and #3 appear on the 1886 Sanborn map. However a figure labeled "old wheel" does appear on the 1886 map in the approximate location of the second wheel. There is no head or tail race connected to this wheel.

While the cotton mill owners did not change the water power system in any substantial way during the nineteenth century, the more successful Standard Paper Company owners made some significant alterations, particularly to the head race that brought water from the canal to the wheels. Initially the head race had to veer eastward and then westward to go around an office and finally reached wheel #1. In 1905, the head race no longer served wheel #1 (since Mill #1 was then being used as a warehouse) so the channel took a straight line into the second wheel. Another factor that may have influenced the changing head race path was the laying of railroad tracks, which first appear on the Sanborn map in 1905.

By 1905 only wheel #2 appeared on the Sanborn map. Physical evidence for this wheel exists today. The canal's penstock gate (10' wide) opens into a head race (66' long) that flows through a trash rack located below the paper company's loading platform. After the water flows past the trash rack it plummets down under the mill until it reaches a concrete conduit on the northern side of Mill #2. This conduit measures 52' long, 10' high, and 7' wide, and is squared with a rounded top. At the end of the conduit is a wheel housing, a twelve-sided stone structure, approximately 11' in diameter and 8' high. After passing through the wheel housing the water flows out the tail race into the river. (See HAER Drawing VA-44, Sheet 8; and HAER Photo Nos. VA-44-8 through VA-44-20)

Physical evidence is also present for wheel #3 which stood at the junction of the two sections that made up Mill #2. In the head race, just south of the trash rack is a large pipe that appears to have at one time diverted water to the third wheel. The wheel housing and three brick conduits are visible in the paper company's basement. The round wheel housing is approximately 10' in diameter; 12' south of the housing are three brick conduit openings, each is about 6' wide and spaced 2' apart. (See HAER Drawing VA-44, Sheet 4)

The same space constrictions faced by the cotton mill owners also challenged the Standard Paper Company owners who purchased the mill in 1901. Initially they made few changes in the site. By 1905 they had converted Mill #1 into a warehouse, expanded the bridge so it connected both the second and third floors, added a steam boiler to the old "picker room," and renovated the raceway between the canal and the turbine on the eastern wall of Mill #2. Mill #2's open interior, a characteristic of all cotton mills, allowed them space to install a large 90" Fourdrinier paper machine.⁴²

But later, from 1901 to 1919, the company found it necessary to expand. The constricted site offered them no choice but to fill in the space between the two mills. They erected an addition which added four rooms, for various operations in the paper making process. They also expanded beyond the site's

perimeter. In the early 1900s they bought land across Hull street at First Street where they erected a separate building for finishing and coating paper. Later, after 1919, they bought the old Marshall Manufacturing Company's cotton mill located southwest of Dunlop flour mill, and converted the structure into another paper mill.

To understand the extensive additions initiated by the Standard Paper Company and the function of the paper-making machinery that remains in Mill #2 requires an understanding of the paper-making process. The transformation of rags into paper involved a series of processes that began after scavengers brought the discarded materials to the mill. Workers then dusted the fabrics to open up the fibers and separated the dirt from the material without harming the fibers. After workers removed buttons and snaps, machines called "rag willows" dusted the cloth by agitating it in a cylindrical barrel which required a 2' x 6' floor space. These machines were located on the third floor of Mill #1, probably because the dusting process filled the air with dirt and fine fibers which needed to be exhausted out open windows and ventilation ducts, while workers required good light to pick through debris.

After dusting, the material was cut up and placed into boilers. The cylindrical, cast-iron or steel machines sat on steel, masonry, or wood supports. The boiling process cleaned the rags of all grease and ground dirt, and further loosened the fibers.

Following the boiling stage, the liquid rag substance moved to the bleachers, which were round Hollander tubs, usually cast-iron or steel, with agitators at the bottom. Glazed tiles protected the walls of the tub from the bleach (usually chlorine gas), and reduced friction which harmed the fibers by causing them to bunch up.

After bleaching, the rags became a liquid pulp which workers then transferred to the beater room (second floor in Mill #2) where large vats (usually 25' long, 11' wide and 3-1/2' high) equipped with a motorized wheel, churned the solution stroking out the fibers and orienting them in the same direction. The beaters resembled the bleachers except they were oval rather than round and had a large wheel with many fine bristles that brushed out the fibers. After running through the beaters, pipes transferred the solution to the stock chests generally located in the basement. These vats held the paper solution until it was time to feed it into the fourdrinier machine.

The fourdrinier machine was the largest and the costliest machine in the paper making plant. This long and wide mechanism resembled an automated assembly line. It included many wheels that rolled the wet solution over numerous felt strips and through various suctioning devices which gradually removed the moisture, leaving only sheets of bounded fibers. The machine automatically rolled up the finished paper product on large spools at the end of the line. Workers then transported these spools to the finishing room where employees cut them into smaller rolls, bundled them into stacks, and wrapped them in coverings for transport. They also added glazes, tints, and textures for

special paper orders in this room.⁴³

Evidence of this paper making process is found in the western additions to Mill #2. (See HAER Photo No. VA-44-29 and VA-44-30) Heavy wooden and steel columns that may have supported the large fourdrinier machine are visible in the ruins of Mill #2. Pipes and conduits, hanging in a tangled mess from the ceiling, once carried paper stock to the boilers, bleachers, beaters, and to the fourdrinier, ventilated the work areas, and vacuumed away waste fluid. Other pipes connected with large pumps propelled the stock through the various conduits and extracted liquid waste from the fourdrinier. The four remaining large vats could have functioned as either bleachers or storage containers. The glazed tile vats most surely were bleachers.

The paper plant operated at the mill site from 1901 to 1976 when it closed. In 1984, Mill #2 suffered extensive fire damage. (See HAER Photos VA-44-31 and VA-44-32) Today the site is vacant and may be demolished to make way for the erection of a flood wall.

Labor

By the mid-19th century, Manchester had become known as a working class community. Black and white laborers employed in industry and domestic work in Richmond or in agricultural work in nearby Chesterfield County found living in Manchester convenient and inexpensive. A handful of immigrant workers, principally Irish and Scots, also resided there and found work in industry or as seamstresses and domestic workers.

Manchester residents depended heavily on the local cotton mills for employment throughout the nineteenth century. Besides jobs in the tobacco factories and grain mills, the cotton establishments provided substantial employment opportunities, especially for numerous women and children living in the small community. In 1866, a recession threatened to shutdown Manchester's leading employer. "We regret to learn that the total suspension of the Manchester Cotton and Wool Mill is in contemplation," wrote one reporter, "but we hope that at no distant day they may be able to resume their old system of work. Should the mills be compelled to suspend totally, there is no calculating the amount of distress that must inevitably follow."⁴⁴

In 1850, according to U.S. Census figures, the Manchester mill employed 150 men and 200 women. By 1860, the mill employed 150 men and women, and by 1870 it employed 30 men, 40 women, and 60 children. Southern mills probably employed a larger number of men before the Civil War. But after the war many women took the place of the men who had died in combat. In Manchester and Petersburg the mill owners employed widows who, upon the death of their husbands, entered the factories in order to support their households.⁴⁵ Furthermore, by 1867, operators of the Manchester cotton mill were also inclined to cut labor costs by hiring "a very large number of women."⁴⁶

The female mill workers in Manchester probably came from the farms in nearby Chesterfield county and from Richmond as well as Manchester itself. During the busy season (in the autumn and spring) they labored twelve hours a day, six days a week. During the summer and early fall season, prior to the arrival of the cotton crop, and when the river was at its lowest, their hours decreased to 55-60 per week. A United States Commission of Labor Report noted in 1888 that Women working in Richmond cotton mills earned \$3.95 a week. These women regularly earned less than \$150 per year, while lawyers, doctors, public officials could earn \$1500-2000 and machinists earned \$700.

Manchester residents depended on the continuous operation of the cotton mills because few factories employed such large numbers of people. Besides several mining companies and one cedar works establishment, no other industry utilized the large work force hired by the cotton mill owners. During the 1840s the Manchester mill employed 250 people, while the Dunlop and McCance flour mills utilized 50 workers.⁴⁷

For women and children the mills represented one of the few opportunities for employment outside of domestic work. Men could secure jobs in a variety of industries where the hard physical labor requirements excluded women workers. Generally, women and children found their employment opportunities limited to the cotton mills and tobacco factories.⁴⁸

Mill owners did not limit their work force to adults but employed a large number of children as well. In some instances parents brought their offspring to work as "helpers". Since the children only assisted their parents and were not formally employed they failed to appear on the work roles. Thus, though the census data only began to indicate their presence in the cotton mills in 1870, they undoubtedly worked in the factories before that date.⁴⁹

Because the textile manufacturers paid low wages whole families worked together in the factories and pooled their earnings to support the household. Children, as young as five labored alongside their parents and performed a variety of tasks. They carried water to the workers, swept the floors, and retrieved broken threads. Their small, nimble hands and fingers made them well equipped to work around the delicate threads. They untied knots and spliced broken strands together.⁵⁰

Though youngsters did all types of work, their inexperience with the whirling textile machinery sometimes led to serious injuries. For example, in one court case involving the Manchester cotton mill, a twelve year old boy sued the company after his arm was badly damaged when it got stuck in a weaving machine.⁵¹

Just as the children had specific jobs in the cotton mill, as too did the men and women employees. Usually, men constituted the "operatives" or skilled laborers. These male operatives worked very long weeks (sometimes in excess of 80 hours) and earned up to \$400 to \$500 a year. They repaired and adjusted the looms, the spinning and carding machines, and the water power system,

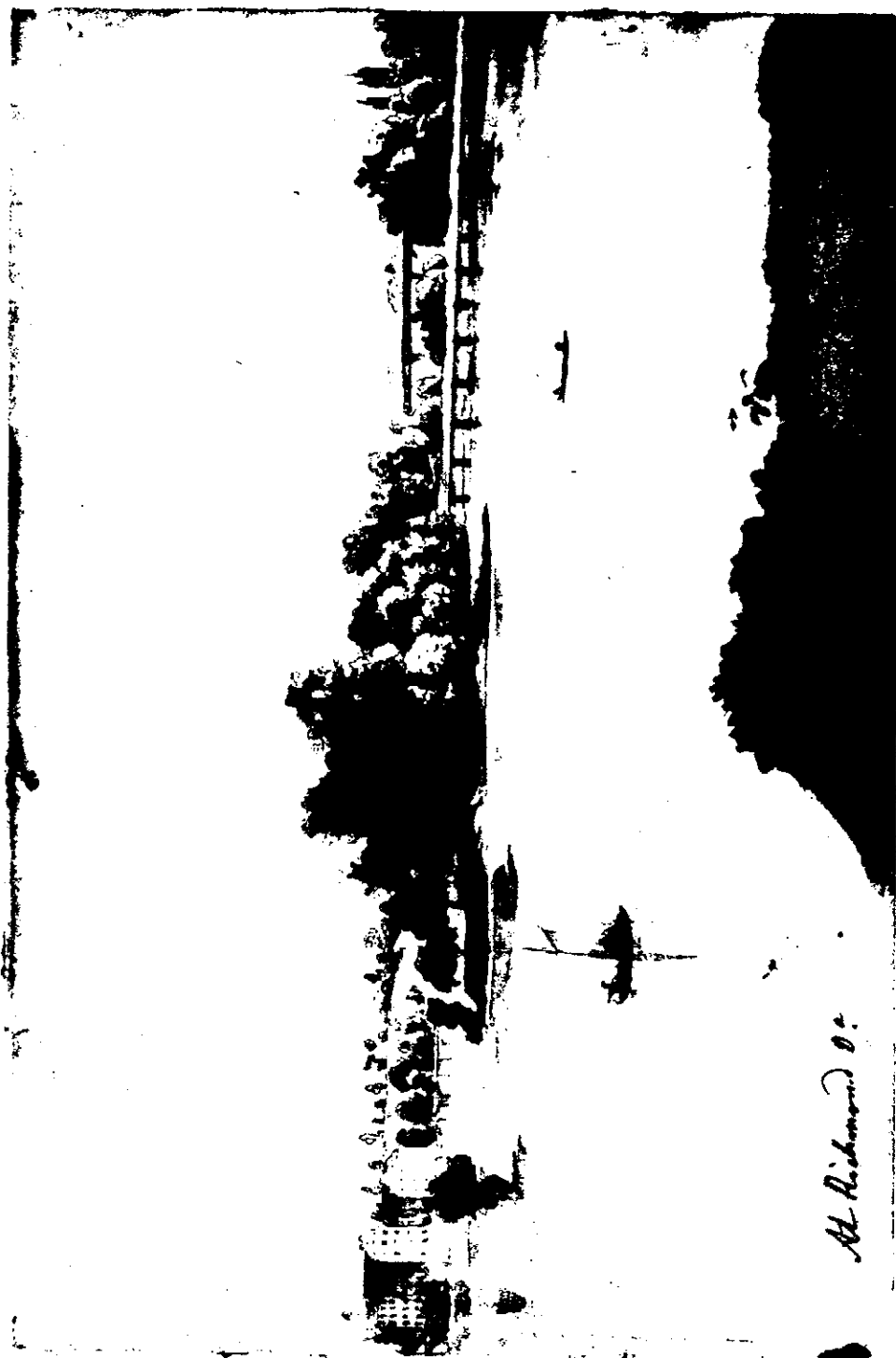
including the gates on the canal, the turbine, and the horizontal shafting. Men also filled all supervisory positions.⁵²

There is no evidence that the cotton mills in Manchester or Petersburg ever owned many slaves. Generally, the Manchester cotton mill profits did not allow for a large investment in bondsmen. However, the 1860 slave census indicated that the Manchester company did own two twenty-year old male slaves. There is no indication of the jobs these bondsmen performed. They may have worked in the picker room, but most likely held custodial jobs or worked at the loading dock and warehouse.

It is quite possible that bondsmen were leased to work in the mill. This was especially true during the 1840s. A notice in a local newspaper stated that the mill desired to "hire for the ensuing year....two hundred boys, girls, and young women. Persons having such slaves at their disposal will do well to call" at the mill office.⁵³ The Manchester mill probably did not employ slaves very long after the 1840s. In general, textile mills throughout the south decreasingly used bondsmen during the 1850s when the rise in cotton prices increased the field slaves value beyond the financial reach of struggling manufacturers.⁵⁴

Other social factors mitigated against the employment of slaves in the mills. White society frowned on the use of slaves in industries where white women and children were employed. In other industries, whites struck in protest of hiring the bondsmen, fearing that the practice would spread to other industries and eliminate their own positions.⁵⁵

As early as 1837, the owners of the Manchester cotton mill were providing tenement housing for a percentage of their employees. Insurance records indicated that the mill authorities owned a servant's house, an overseer's house and a smoke house. The presence of nearby Richmond made it unnecessary to build workers' housing on the same scale as seen in northern cotton mills and later in the southern piedmont mill villages. However, in October of 1876 when Alex Donnan and J. Wesley Friend sold the mill the S.P. Arrington he also purchased eighteen tenement houses located in Manchester on Second and Third Streets between Hull and Decatur.⁵⁶



At Richmond Va.

FIGURE #1
THE JAMES RIVER, WITH MANCHESTER MILL AT LEFT, CA. 1845
Koeller Collection, Virginia Historical Society

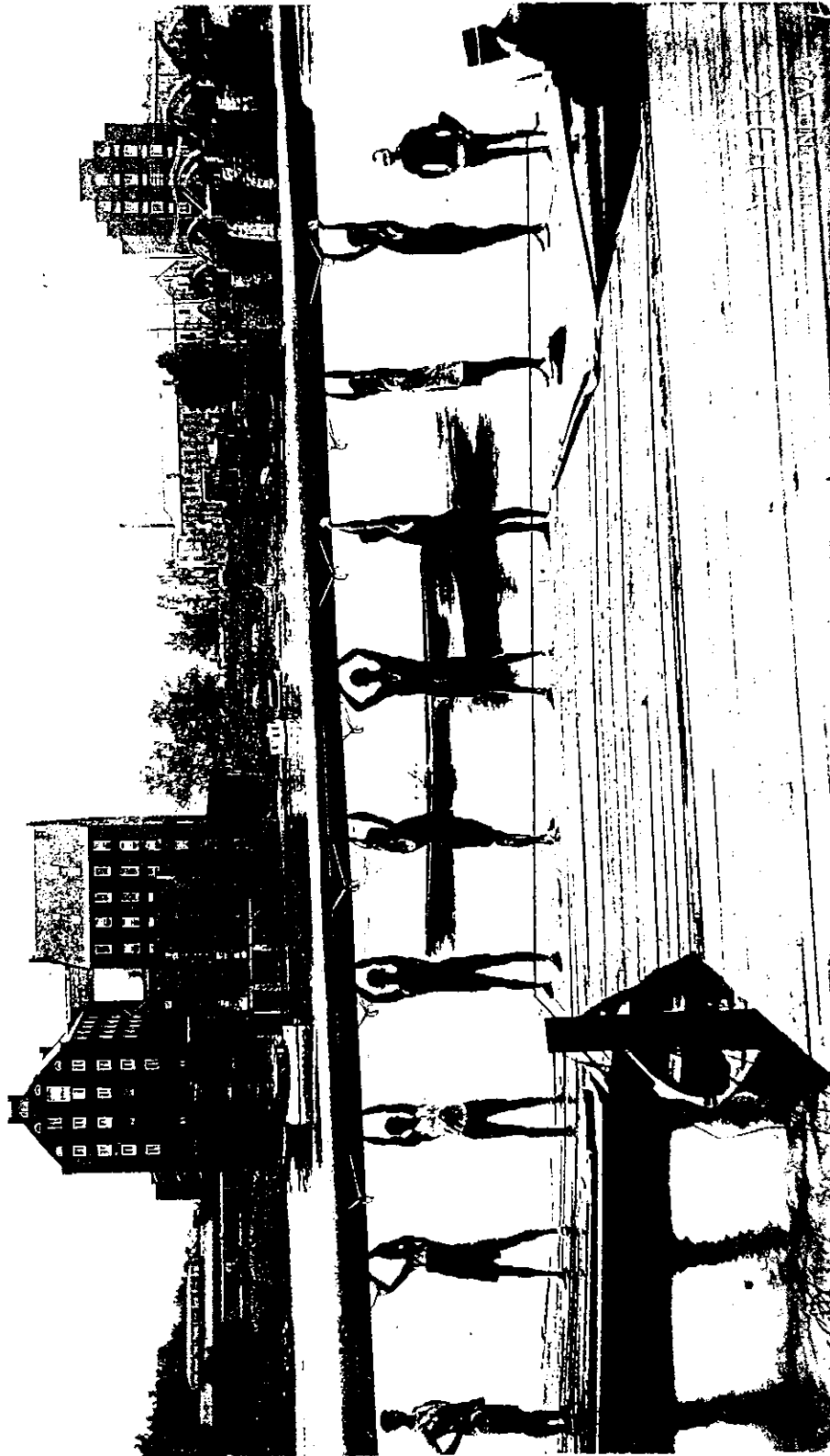


FIGURE #2
MANCHESTER MILL AT RIGHT, CA. 1890
Cook Collection, Valentine Museum

Manchester Mill
HAER No. VA-44 (Page 23)



FIGURE #3
MANCHESTER MILL FROM MAYO BRIDGE, CA. 1890
Cook Collection, Valentine Museum

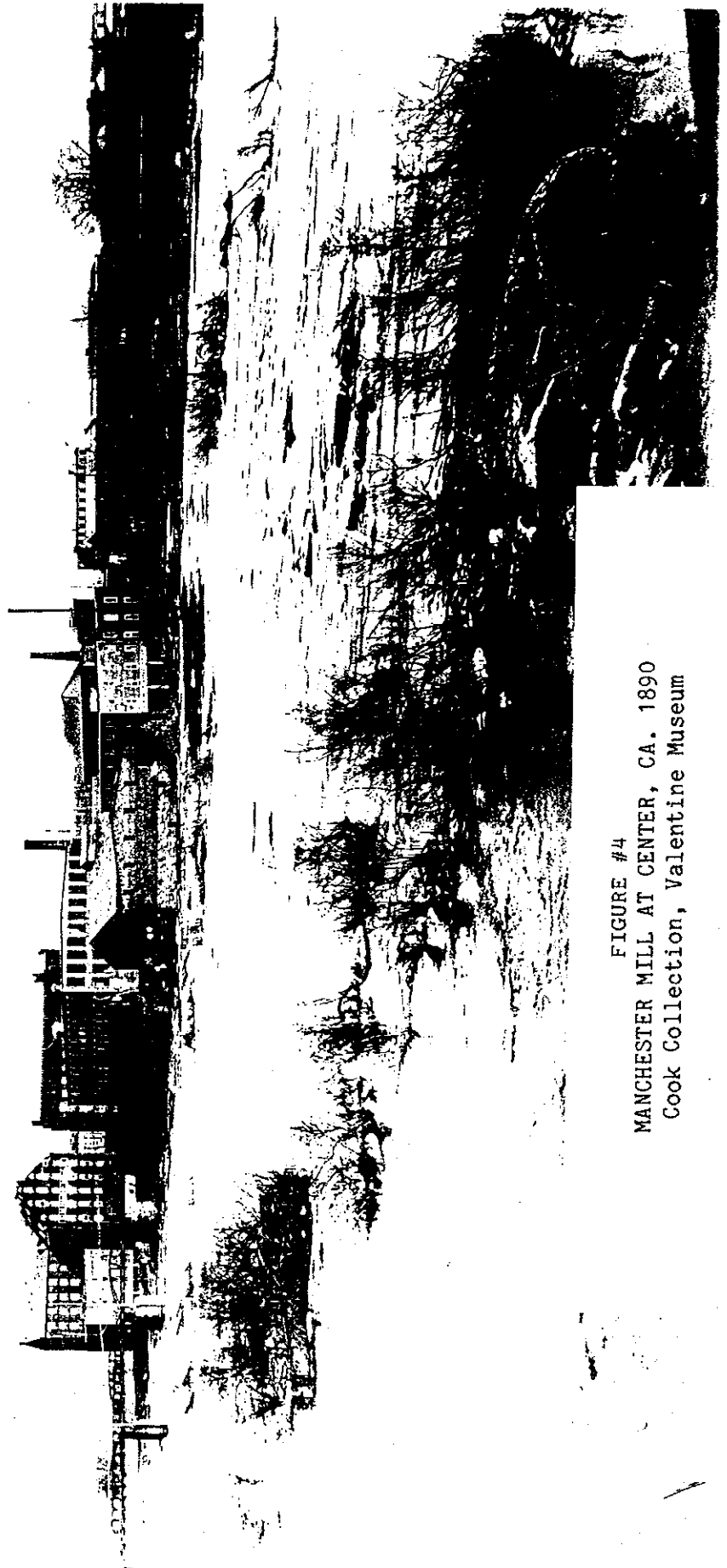


FIGURE #4
MANCHESTER MILL AT CENTER, CA. 1890
Cook Collection, Valentine Museum



FIGURE #5
MANCHESTER MILL AT LEFT, 1852
Virginia Historical Society

4

—[SUPERIOR FACTS]—

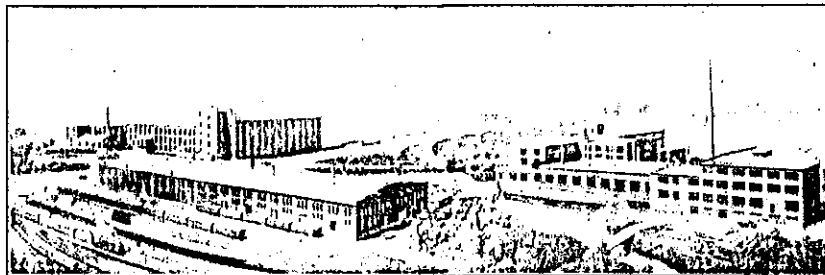


FIGURE #6
STANDARD PAPER MANUFACTURING CO.,
MANCHESTER MILL BUILDINGS AT LEFT, 1929
Superior Facts, Vol. 2, No. 10, April 1929

PROJECT STATEMENT

This recording project was undertaken during the summer of 1986 by the Historic American Engineering Record (HAER) of the National Park Service in agreement with the Norfolk, Virginia District of the U.S. Army Corps of Engineers. The field work, measured and interpretive drawings, historical report, and large-format photography were prepared under the supervision of Robie S. Lange, HAER Historian. The field supervisor and team historian was Joseph A. Rodriguez (University of California, Berkeley). The measured and interpretive drawings were prepared by Michael Hamilton (University of Notre Dame), architectural supervisor, and Deborah Cooper (University of Illinois at Urbana-Champaign), architectural delineator. Richard K. Anderson, HAER architect, assisted with the design and review of the drawings. Brent Glass, Director of the North Carolina Humanities Committee, assisted with the preparation and review of the historical report. Large-format photography was prepared by Jet Lowe, HAER photographer. The City of Richmond, Department of Public Works, Bureau of Engineering, provided logistical support to the HAER field team.

BIBLIOGRAPHICAL ESSAY

Sources relating to the history of Manchester and the Manchester Cotton and Woolen Manufacturing Company were located in a variety of repositories in Richmond, Virginia. Maps and photographs were especially valuable sources for understanding the mill's physical evolution. The Sanborn Insurance Maps of Richmond and Manchester, located at the Virginia State Library, showed the transformation of the mill over a thirty year period. The maps covered the years 1886, 1895, 1905, 1910, and 1919, and gave a rough date for the construction of various additions, indicated building dimensions, wall thickness and construction material, and the locations of the turbines. Unfortunately, besides indicating the number of spindles, the insurance maps gave no information regarding the type of machines used in the cotton mill.

Photographs were also valuable sources for acquiring rough dates for alterations to the mill. Mathew Brady documented the Civil War's calamitous affect on Richmond and included Manchester in some of his pictures. These photographs showed the Manchester Cotton Mill as it probably appeared from its inception in the late-1830s until the 1880s when the owners made changes. At the Valentine Museum in Richmond, two Cook photographs showed the mill as it appeared in the 1880s and 1890s.

Much of the mill's early history remains a mystery. The only information regarding the founding of the factory was located in the Minutes of the Manchester Trustees 1811-1875, in three volumes at the Virginia State Library.

Bits of information describing the mill's machinery was located in several sources. These included gazatteers such as Richmond Virginia and the New South (Richmond, 1889), Chesapeake and Ohio Railroad, Rambles on the Path of the Steam Horse, Part II, City of Richmond and Environs (New York, 1884), and in Montague's Richmond Directory and Business Advertiser (Richmond, 1851). Finally, one auction notice in the Richmond Daily Whig (August 11, 1871) listed the machinery in place at that time. However, no detailed information was found regarding the mill's original machinery.

In terms of the cotton mill's economic development over the 19th century, numerous sources were consulted. Unfortunately, no company records have survived. Generally, the most informative sources were the Richmond Dispatch and the Daily Whig but those newspapers, because they focused primarily on activities in the large metropolis, shed little light on occurrences south of the James. One document Report of the Investigating Committee on the Affairs of the Manchester Cotton and Wool Manufacturing Company (Richmond, 1855), located at the Virginia State Historical Society, described the mill's economic troubles during the 1850s which led the owners to consider selling the business. The U.S. Census of Products of Industry (1850, 1860, 1870, 1880) covered the industries along the Manchester Canal and gave statistics on

capitol invested, raw products used, annual production and value of production, and some labor information. Unfortunately, the 1880 surveyor failed to include the Old Dominion Cotton Mill (formerly Manchester Mill) in the report.

Besides the figures found in the census data, labor information came from gazatteers and directories, and several newspaper articles. Information regarding the use of slaves was found in the 1860 slave schedule for Chesterfield County, and in one advertisement in the Daily Whig (January 4, 1841), which suggested that the mill owners leased bondsmen to work in the factory.

Information regarding the city of Manchester and its canal was also found in a variety of sources. The Richmond directories and gazatteers covered the suburb intermittently. Montague's and Chataign's Directory of Richmond Virginia (Richmond, 1883-4) included listings of Manchester businesses and residents. Biographical sketches of some of the industries located around the Manchester Canal were found in the directories and gazatteers mentioned above and in James P. Wood, The Industries of Richmond (Richmond, 1886). One especially helpful report was F.P. Leavenworth, The Report of the Committee of the Manchester Council on the Subject of the Annexation of Manchester to Richmond, (Richmond, 1879) which gave a list of all the factories located along the canal, the year they were founded, the water rent they paid, and the products they produced. Finally, one newspaper article in the Richmond Dispatch (July 10, 1867) gave a tour of the canal and explained the backgrounds of each industry located along the water channel.

The gazatteers and directories provided some biographies of the Manchester cotton mill's owners. Especially informative on Samuel P. Arrington was Wood, Industries of Richmond, and The City of Petersburg, Virginia: The Book of Its Chamber of Commerce (Petersburg, VA, 1894). William D. Henderson, Gilded-Age City: Politics, Life, and Labor in Petersburg, Virginia, 1874-1889 (Lanham, MD, 1980) also gave information regarding Arrington, who owned the Swift Creek Cotton Mill near Petersburg and the Old Dominion Cotton Mills in Manchester.

Secondary sources provided a breadth of knowledge on a wide range of issues including Richmond history, southern economic history and slavery. Particularly useful was Michael B. Chesson, Richmond After the War, 1865-1890 (Richmond, 1981), on Richmond's industrial development. On general southern economic history Gavin Wright, Old South, New South (New York, 1986) was informative. Wright views the inability of the southern industries to succeed as the result of a lack of cheap labor which was related to the price of cotton. When cotton prices rose, as they did in the 1850s, planters invested in slaves, which forced southern industrialists to compete over the remaining white workers. The slaveholders also invested most of their earnings in labor, rather than in improving their land and transportation systems which also hindered the growth of southern manufacturing. Wright is basically responding to a group of economists who have argued that labor was cheap and abundant in the antebellum south, and that other factors (such as a deficient

railway network, insufficient water power, powerful planters who did not want the rise of a bourgeoisie to threaten their autonomy) actually stunted southern industry in the antebellum years. See Stephan J. Goldfarb "A Note on Limits to the Growth of the Cotton-Textile Industry in the Old South, "Journal of Southern History 48:4 (1982), 545-558. Thomas Terrel Jr., "Eager Hands" Labor of Southern Textiles, 1850-1860, "Journal of Economic History 36:1 (1981), 86-87. Also see National Register for Historic Places, "Nomination Form," prepared by the Virginia Historic Landmarks Commission on Manchester Cotton and Wool Manufacturing Co.

NOTES

1. The South in the Building of the Nation, 5 vols. (Richmond 1909, vol. 5), 317-318.
2. Gavin Wright, Old South, New South: Revolutions in the Southern Economy Since the Civil War (New York, 1986), 128.
3. Stephen Goldfarb, "A Note on the Limits to the Growth of the Cotton Textile Industry in the Old South," Journal of Southern History 48:4 (1982), 545; William D. Henderson, Gilded-Age City: Politics, Life, and Labor in Petersburg, Virginia, 1874-1889 (Lanham, MD 1980), 453.
4. Henderson, Gilded Age City, 458.
5. Wright, Old South, New South, 128; Textile History Review, 3:4 (October, 1962), 200.
6. Report of the Investigating Committee on the Affairs of the Manchester Cotton and Wood Manufacturing Company (Richmond 1855).
7. William D. Henderson, "A Great Deal of Enterprise: The Petersburg Cotton Mills in the Nineteen Century," Virginia Cavalcade 30 (Autumn, 1980), 177.
8. Henderson, Gilded-Age City, 463; Richmond Dispatch, August 14, 1871 and October 28, 1876; In 1871, Christopher C. McCrae, Lawson Nunally, R.D. McIlwaine, Frank Potts, S.S. Bridges, Edward Graham, J. Wesley Friend, and Alex Donnan all of Petersburg, bought the mill for \$121,000. Donnan was a Scottish immigrant who was also president of the Matoaca Manufacturing Company after the Civil War. S.P. Arrington paid \$53,000 for the mill in 1876. He owned the Swift Creek Mill along the Appomattox River near Petersburg, and with his brother R.T. Arrington, owned a wholesale grocery store in Petersburg. John Arrington, their father, founded the business in 1866. These natives of North Carolina also owned a commission house in Richmond at Shockoe Slip called Arrington and Scott. R.T. Arrington was a "principal" in the Roanoke Navigation and Water Power Company of North Carolina while he served as president of the Old Dominion (formerly Manchester) Cotton Mill in the 1880s and 1890s.
9. Wright, Old South, New South, 39-47.
10. Ibid., Chapter 5.
11. Michael B. Chesson, Richmond After the War, 1865-1890 (Richmond, 1981), 8-9.

12. Ibid., 9.
13. Ibid., 10.
14. Ibid., 118.
15. F. P. Leavenworth, Report of the Committee of the Manchester Council on the Subject of the Annexation of Manchester to Richmond (Richmond, 1879), 14.
16. Chesson, Richmond After the War, 176-177; Ann Woodrief, In River Time: The Way of the James (Chapel Hill, 1985), 126.
17. Chesson, Richmond After the War, 15-16; U.S. Bureau of the Census, Tenth Census of the United States, 1880, Population, Chesterfield County, Manchester District, 12-31.
18. Leavenworth, Report of the Committee, 11-12.
19. Minutes of the Manchester Trustees, October 17, 20, 1871.
20. See Richmond Dispatch, February 24, 1866, August 12, 1871; Richmond Daily Whig, April 2, 1866, October 2 & 14, 1870, April 2, 1886.
21. Richmond Dispatch, July 10, 1867; W.P. Trowbridge, Report on Water Power in the United States (Washington, D.C., 1885), 15.
22. Henderson, Gilded-Age City, 454.
23. Ibid. The frequent episodes of inadequate water supply suggest that the James River, too, was a small stream that could not supply sufficient horsepower.
24. Richmond Daily Whig, September 26, 1871; See also Richmond Dispatch, July 10, 1867.
25. Leavenworth, Report of the Committee, 17; Trowbridge, Water Power of the United States, 16.
26. Minutes of the Manchester Trustees, January 28, 1832, 193-194.
27. Richmond in By-Gone Days (Richmond, 1856), 249-250.
28. See Map of the City of Richmond, 1864, A.D. Bache, U.S. Coast Survey.
29. Sanborn Map of Richmond and Manchester, 1886, Sheet 31.
30. Ibid., 1895, Sheet 2; 1905, Sheet 2; 1910, Sheet 21; Sanborn Map of South Richmond, 1919, Sheet 2.

31. Ibid., Sheet 2.
32. William H. Pierson, Jr. American Buildings and Their Architects (Garden City, N.J. 1970), 42-44; Martha and Murray Zimiles, Early American Mill (New York, 1973), 112-113, 163-164.
33. James P. Wood, The Industries of Richmond (Richmond, 1886), 97; Sanborn Map of Richmond and Manchester, 1905, Sheet 2.
34. Sanborn Map of Richmond and Manchester, 1905, Sheet 2.
35. Sanborn Map of Richmond and Manchester, 1910, 1919, 1952.
36. See Carl W. Condit, American Building: Materials and Techniques from the Beginning of the Colonial Settlements to the Present (Chicago, 1968), 86.
37. Report of the Investigating Committee on the Affairs of the Manchester Cotton and Wool Manufacturing Company.
38. Montague's Richmond Directory and Business Advertiser (Richmond, 1851), 13; Report of the Investigating Committee.
39. Auction notice published in the Richmond Daily Whig (August 11, 1871) gave the following list: 1 Double Header, 40 inch lap; 1 Triple Lap Machine, 40 inches wide, both made by Taylor and Lange, England; 14 Higgins' English automatic cards, 40 inches, self-strippers; 2 Higgins' English drawing frames 3 heads each, 5 deliveries; 2 Higgins' English stubbers, 65 spindles each; 1 Higgins' English speeders, 120 spindles each; 1 Higgins' English improved grinder; 86 Throttle flyer frames, 182 spindles each; 18 Ring-filling frames, 132 spindles each; 4 Dressing frames, with copper steam cylinders; 208 looms. These machines produced shirtings, sheetings, and oznaburgs from the 1850s to the 1880s. One gazatteer noted that in 1880 the Old Dominion Cotton Mill was manufacturing 28 inch Manchester Drillings, 4-4 Old Dominion Standard Drillings, and 3, 4, and 5 ply Manchester Shirting. There is no evidence that the company ever produced woolen goods, in spite of its name. See R.A. Brock, Richmond as a Manufacturing and Trading Centre; Including a Historical Sketch of the City (Richmond, 1880), 64.
40. Later Sanborn maps claimed that the mill had 5-1/2 stories, but this reflected the person doing the survey and not any physical change in the mill.
41. Richmond Virginia and the New South, 126; Rambles in the Path of the Steam Horse, 125.
42. Sanborn Map of Richmond and Manchester, 1905, Sheet 2; Superior Facts 2:10 (April, 1929), 10.

43. For a description of paper making consult George S. Witham, Modern Paper Making; A Practical Treatise (New York, 1920; Robert Henderson Clapperton and William Henderson, Modern Paper Making (Oxford, 1929); Thomas Wightman Chalmers, Paper Making and its Machinery (New York, 1920).
44. Richmond Dispatch, April 13, 1866.
45. Henderson, Gilded-Age City, 463; "A Great Deal of Enterprise," 180.
46. Richmond Dispatch, July 10, 1867.
47. Seventh Census, 1850, Industry, 59. Richmond Virginia and the New South, 113, 126-127.
48. Seventh Census, 1850, Industry, 59, In 1850 the six mining companies in Chesterfield County employed only men.
49. Melvin Thomas Copeland, The Cotton Manufacturing Industry in the United States (Cambridge, Mass., 1912), 43.
50. Henderson, "A Great Deal of Enterprise," 180; Henderson, Gilded-Age City, 463.
51. George W. Hansbrough, Cases Decided in the Supreme Court of Virginia (Richmond, 1888), 140.
52. Henderson, "A Great Deal of Enterprise," 179-180; Eighth Census of the United States, 1860, Slave Schedule 2, Chesterfield County, 46.
53. Richmond Daily Whig, January 4, 1841.
54. G. Wright, "Cheap Labor and Southern Textiles Before 1880," Journal of Economic History, 39:3 (1979), 669-670; T.E. Terrel "Eager Hands: Labor for Southern Textiles, 1850-1860," Journal of Economic History, 36:1 (1981), 86-87.
55. Skilled white workers struck the Tredegar Iron Works when the owner attempted to replace them with slaves. See Charles B. Drew, Ironmaker to the Confederacy: Joseph R. Anderson and the Tredegar Iron Works (New Haven, Conn., 1966), 23-24.
56. Richmond Dispatch, October 28, 1876; Mutual Assurance Records, Chesterfield County, Reel 15, v. 101, No. 10355, Virginia State Library; Mills in Petersburg also provided housing for some of their operatives. See Henderson, Gilded-Age City, 461-2.